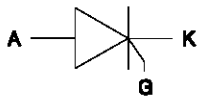
SGS-THOMSON MICROELECTRONICS

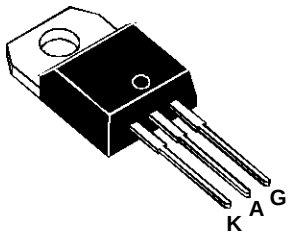
# TYN 225 ---> TYN 1225

## SCR

### FEATURES

- HIGH SURGE CAPABILITY
- HIGH ON-STATE CURRENT
- HIGH STABILITY AND RELIABILITY




**TO220AB**
(Plastic)

### DESCRIPTION

The TYN 225 ---> TYN 1025 Family Silicon Controlled Rectifiers are high performance glass passivated chips technology.
This general purpose Family Silicon Controlled Rectifiers is designed for power supply up to 400Hz on resistive or inductive load.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (180° conduction angle) | Tc = 95 °C | 25 | A |
| $I_{T(AV)}$ | Average on-state current (180° conduction angle, single phase circuit) | Tc = 95 °C | 16 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current ( Tj initial = 25°C ) | tp = 8.3 ms | 260 | A |
| | | tp = 10 ms | 250 | |
| $I^2t$ | $I^2t$ value | tp = 10 ms | 310 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply : $I_G$ = 100 mA $di_G/dt$ = 1 A/µs | | 100 | A/µs |
| Tstg<br>Tj | Storage and operating junction temperature range | | - 40 to + 150<br>- 40 to + 125 | °C<br>°C |
| Tl | Maximum lead temperature for soldering during 10 s at 4.5 mm from case | | 260 | °C |

| Symbol | Parameter | TYN | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | 225 | 425 | 625 | 825 | 1025 | 1225 | |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage<br>Tj = 125 °C | 200 | 400 | 600 | 800 | 1000 | 1200 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| Rth (j-a) | Junction to ambient | 60 | °C/W |
| Rth (j-c) DC | Junction to case for DC | 1.3 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$ = 1W $P_{GM}$ = 10W (tp = 20 µs) $I_{FGM}$ = 4A (tp = 20 µs) $V_{RGM}$ = 5 V.

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Value | Unit |
|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | MAX | 40 | mA |
| $V_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | MAX | 1.5 | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $R_L$=3.3kΩ | Tj= 125°C | MIN | 0.2 | V |
| tgt | $V_D$=$V_{DRM}$ $I_G$ = 200mA<br>$dI_G/dt$ = 1.5A/µs | Tj=25°C | TYP | 2 | µs |
| $I_L$ | $I_G$= 1.2 $I_{GT}$ | Tj=25°C | TYP | 80 | mA |
| $I_H$ | $I_T$= 100mA gate open | Tj=25°C | MAX | 50 | mA |
| $V_{TM}$ | ITM= 50A tp= 380µs | Tj=25°C | MAX | 1.6 | V |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ Rated<br>$V_{RRM}$ Rated | Tj=25°C | MAX | 0.01 | mA |
| | | Tj= 125°C | | 4 | |
| dV/dt | Linear slope up to $V_D$=67%$V_{DRM}$<br>gate open | Tj= 125°C | MIN | 500 | V/µs |
| tq | $V_D$=67%$V_{DRM}$ $I_{TM}$= 50A $V_R$= 25V<br>$dI_{TM}/dt$=30 A/µs $dV_D/dt$= 50V/µs | Tj= 125°C | TYP | 70 | µs |

**Fig.1 :** Maximum average power dissipation versus average on-state current.

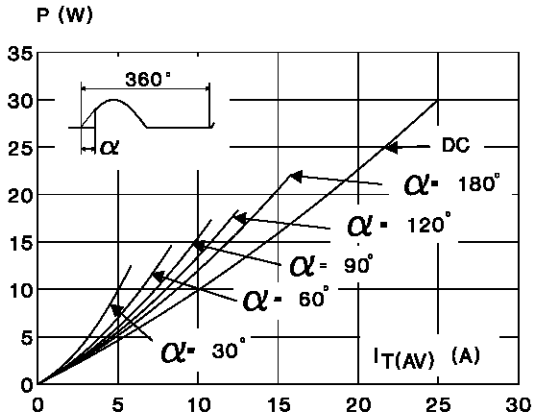



**Fig.2 :** Correlation between maximum average power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact.

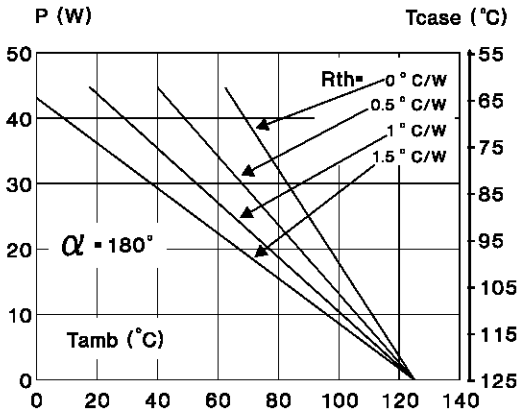



**Fig.3 :** Average on-state current versus case temperature.

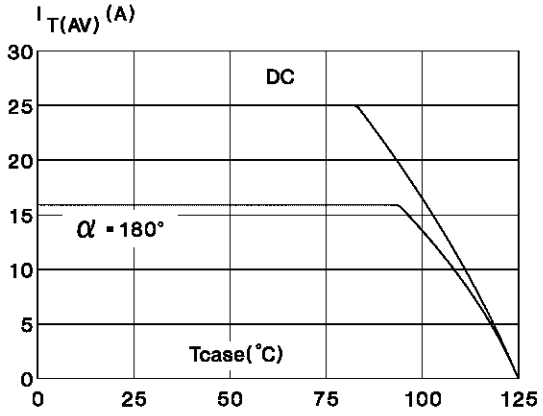



**Fig.4 :** Relative variation of thermal impedance versus pulse duration.

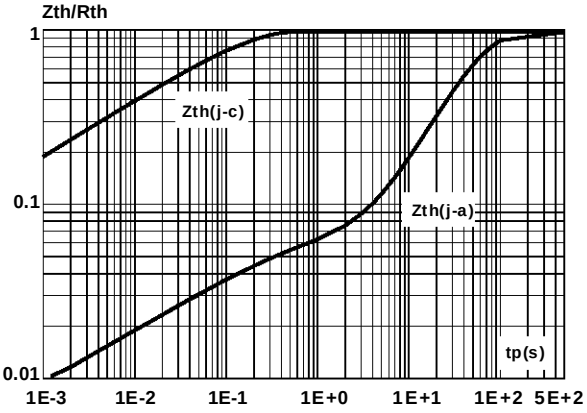



**Fig.5 :** Relative variation of gate trigger current versus junction temperature.

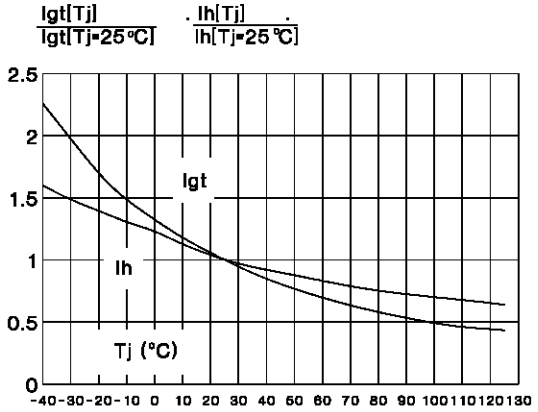



**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

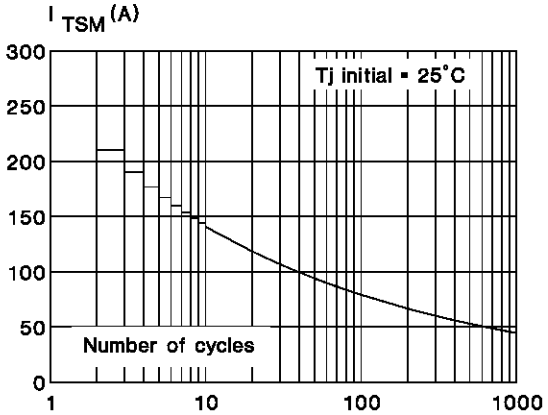


**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10 ms, and corresponding value of $I^2t$.

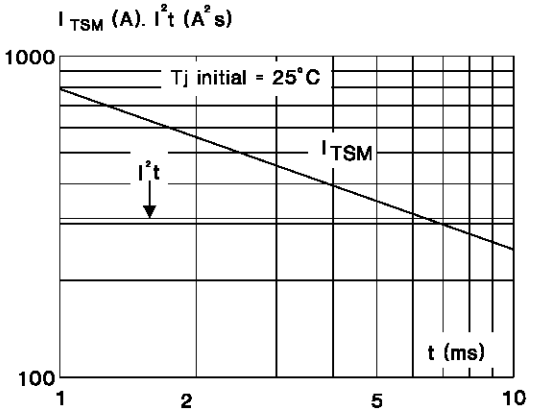
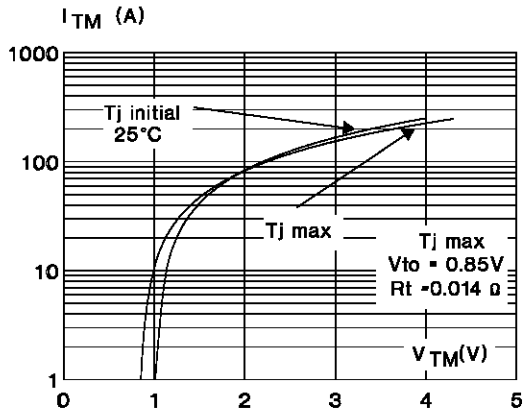
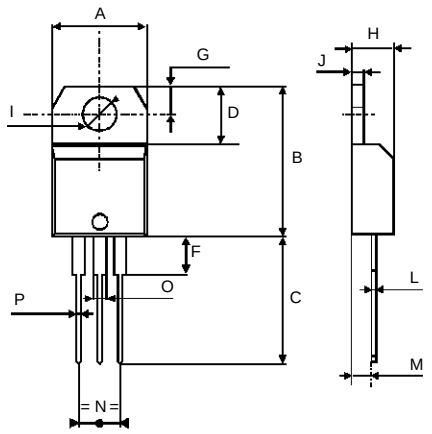



**Fig.8 :** On-state characteristics (maximum values).




## PACKAGE MECHANICAL DATA

TO220AB Plastic




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 10.00 | 10.40 | 0.393 | 0.409 |
| B | 15.20 | 15.90 | 0.598 | 0.625 |
| C | 13.00 | 14.00 | 0.511 | 0.551 |
| D | 6.20 | 6.60 | 0.244 | 0.259 |
| F | 3.50 | 4.20 | 0.137 | 0.165 |
| G | 2.65 | 2.95 | 0.104 | 0.116 |
| H | 4.40 | 4.60 | 0.173 | 0.181 |
| I | 3.75 | 3.85 | 0.147 | 0.151 |
| J | 1.23 | 1.32 | 0.048 | 0.051 |
| L | 0.49 | 0.70 | 0.019 | 0.027 |
| M | 2.40 | 2.72 | 0.094 | 0.107 |
| N | 4.80 | 5.40 | 0.188 | 0.212 |
| O | 1.14 | 1.70 | 0.044 | 0.066 |
| P | 0.61 | 0.88 | 0.024 | 0.034 |

Cooling method : C
Marking : type number
Weight : 2.3 g

Recommended torque value : 0.8 m.N.
Maximum torque value : 1 m.N.

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